



**National Infrastructure  
Simulation & Analysis  
Center (NISAC)**

Los Alamos National Laboratory  
and Sandia National Laboratories  
have joined in partnership  
to leverage their existing research  
and development activities,  
and have established a critical  
infrastructure modeling,  
simulation, and analysis center.



This National Infrastructure Simulation  
and Analysis Center (NISAC) will focus  
on interdependencies and represents  
a capability not available elsewhere.

This Center will evolve to provide our  
nation's government and industry  
decision makers with the best  
available analytic predictive resources  
to protect the nation's critical  
infrastructures.





## The Vulnerability

The quality of life and the national security of the United States relies on the continuous operations of a complex set of infrastructures consisting of electric power, oil and gas, transportation, water, communications, banking and finance, law enforcement, government, agriculture, and others. Today, they are heavily dependent upon one another and becoming more so. Disruptions in any one of them could jeopardize the continued operation of the system of infrastructures. Subtle changes can have very large impacts. Though the United States' infrastructures are tightly coupled and interdependent, they have historically been treated as stand-alone and independent systems. This approach is largely because analytic tools and computational capability do not exist to allow a "holistic" analytic approach.

The National Infrastructure Simulation and Analysis Center (NISAC) has been established to meet the need for a comprehensive capability to assess our nation's system of interdependent infrastructures.

## NISAC Charter

Congress formally chartered NISAC (Section 1016 of Public Law 107-56, the USA Patriot Act, 10/26/2001 ), designating it to "serve as a source of national competence to address critical infrastructure protection and continuity through support for activities related to counterterrorism, threat assessment, and risk mitigation."

## NISAC Mission

Provide fundamentally new modeling and simulation capabilities for the analysis of critical infrastructures, their interdependencies, vulnerabilities, and complexities. These advanced capabilities will help improve the robustness of our nation's critical infrastructures by aiding decision makers in the areas of policy analysis, investment and mitigation planning, education and training, and real-time assistance to crisis response organizations.

## NISAC Objectives

- 1) Leverage the *existing capabilities* of the NISAC partners to provide leadership in critical infrastructure interdependencies modeling, simulation, and analysis;
- 2) Establish a *virtual capability* that will provide a portal for nation-wide remote access and communications to infrastructure-related modeling, simulation, and analysis capabilities;
- 3) Move toward a *predictive capability* that uses science-based tools to understand the expected performance of interrelated infrastructures under various conditions;
- 4) Provide *simulation and analysis capabilities* to a wide range of users that will enhance the understanding of vulnerabilities of the national infrastructures and establish priorities and potential mitigation strategies for protecting the infrastructures;
- 5) Provide decision-makers the *ability to assess policy and investment options* that address critical infrastructure needs -near and long term;
- 6) Provide *education and training* of public and private decision makers on how to cope effectively with crisis events;
- 7) Provide an *integrating function that includes interdependencies*; bring disparate users and information providers and individual infrastructure sector leaders together.

## Leveraging Existing Research & Development

Sandia National Laboratories (SNL) and Los Alamos National Laboratory (LANL) have established strong and unique capabilities in modeling and simulation of infrastructures and infrastructure interdependencies. The extent of these capabilities provides leverage in the development of NISAC.

## Unique Capabilities of NISAC

- Knowledge of high performance computing software and operations
- Demonstrated capability in addressing infrastructure interdependency issues and complexities
- Existing, extensive suite of infrastructure models previously developed under funding from a number of sponsors
- Capabilities to address all areas of infrastructure protection, including cyber and physical security



## Moving Into the Future

NISAC's program builds upon SNL's and LANL's technology base, and is forging collaborations with key private sector, academic, and government organizations. These collaborations will mutually benefit NISAC and its partners, providing stakeholders access to the most advanced infrastructure interdependency analyses and tools available. NISAC will provide a neutral, standing interaction environment in which industry and government can work together to identify and address critical issues in infrastructure protection, mitigation, and response.

- **Architecture Development.** As a virtual center for models and simulations, NISAC is developing means for disparate infrastructure models, simulations, and databases to interoperate in a seamless and secure fashion. NISAC is articulating appropriate standards that will enable agencies, organizations and infrastructure sector owners to collaborate with each other and NISAC.
- **Data.** A crucial need for models and simulations is data, which allow the analyses to reflect the actual environment under study. The ability to collect, correctly identify, validate, store, and retrieve large volumes of data is key to successful analysis of our nation's critical infrastructures. NISAC is implementing an architecture to address these data issues and to allow secure sharing and protection of data from any source, including proprietary information.
- **Model Development.** NISAC is building upon its broad technology base to develop analysis capabilities of interdependent critical infrastructures at local, regional, and national scales.

## Summary

Utilizing the broad science base, simulation capabilities, and analysis expertise resident at SNL and LANL, The National Infrastructure Simulation and Analysis Center (NISAC) will provide critical support to government and industry decision makers in infrastructure issues to improve the national security and quality of life of the United States.

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